These values do not allow for heat loss; that is, this volume of brickwork, when heating, would have a temperature change from 20° to 50° greater than when on blast, as the 100° change is the change covering the heat transferred to the blast.

The temperature of the blast increases 830° in the checker. The average rate of increase assumed will determine the time allowed for heating and, with the blast volume, the space required in the checkerwork. Assuming a heating rate of 100° per second, the time necessary will be 8.3 seconds. Slower or faster rates of heating will correspondingly affect the time as well as the apuoo required to contain the blast while heating. The volume of froo air blown per second is 16 m^3 78, its average temperature in tho checker is 485°, and it is under a pressure of one atmosphere, tho volume under these conditions being 23 m^3 33, which, multiplied by 8.3, the heating time, fixes the space required as 193 m^{3} 70. The total checker volume will be, therefore, 193.70+368.80 = 562 m^3 50.

The brick coefficient = 368.80 -*• 562.50 = 0.6557.
The pass coefficient = 193.70-4-562.80 = 0.3443.

The side of the square for the pass unit = V0.3443 = 0.5868.

The portion of the unit square occupied by the brickwork will be 1.0000-0.5868 = 0.4132.

As the cooling time of the stove is one hour, it is not desirable to make the wall thickness between the passes greater than 75 mm; therefore the side of the unit square will be 75 — 0.4132= 181.5 mm or, say, 180 mm. The diameter of the square pass will be 180-75 = 105 mm = 4.125 ins.

The area occupied by a checker unit = 0. ISO^2 = 0 rn^2 0324
The area occupied by the pass =

0.105^2 = 0 rn^2 0110

The area occupied by brick = Om^2

0214

The lineal amount of checker required, based upon the pass = 193.70-0.0110=17,609 m, or, if based on tho brick = 368.80-f-0.0214 = 17,230 m. Using the largest of these values arid assuming a checker height of 25 m, the number of passes = 17,609-r-25.00 = 704.